

MAXWELL SPECIAL UTILITY DISTRICT

**2022 CAPITAL
IMPROVEMENTS PLAN**

December 2022

Board Approved:

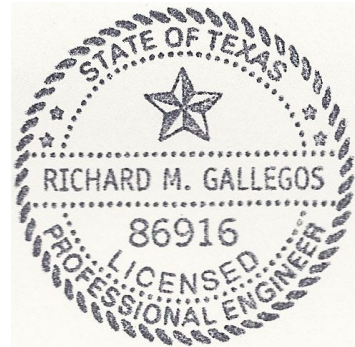
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MAXWELL SPECIAL UTILITY DISTRICT

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December 5, 2022



A handwritten signature in blue ink, appearing to be "R. Gallegos", written over the bottom right portion of the professional seal.

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1. EXECUTIVE SUMMARY

The purpose of this Capital Improvements Plan Report is to provide Maxwell Special Utility District (Maxwell SUD) with a basis for proposed projects to allow the water system to provide continuous and adequate water service to all its CCN area. This Capital Improvements Plan (CIP) will identify system improvements and facility expansions deemed necessary by the Engineer and approved by the Maxwell SUD Board for a time period not to exceed the next ten years. This report describes existing system capacity conditions, proposed projects based on recent inquires and known growth areas, anticipated construction costs and describes possible funding options in order to complete essential projects prior to creating an infrastructure deficiency within the existing water system.

1.1 History and General Description of Maxwell SUD

1.1.1 History

Maxwell Special Utility District was incorporated in June of 1970. The district was formed for the purpose of furnishing a water supply for general farm use and domestic purposes to individuals residing in the rural community of Maxwell, Texas, and the surrounding rural areas. The district holds a Certificate of Convenience and Necessity, number 10293, from the Public Utility Commission of Texas to provide water utility service within its designated service area.

1.1.2 Description of Existing Water Service Area

Maxwell SUD is located in Caldwell and Hays Counties generally east of San Marcos, Texas. The district is generally bounded by HCR 159 to the north, FM 20 to the east, U.S. 80 to the south and Post Road to the west.

The developed areas of Maxwell SUD area are comprised mostly of rural single family residential with multi-acreage home sites. The rural and unincorporated community of Maxwell, Texas, is a more traditional development with approximate densities of two or three lots per acre. Sparse commercial development exists along State Highway Numbers 21, 80, and 142, consisting mainly of small grocery or convenience stores, gas service stations and automotive repair facilities.

There are a several areas located throughout the system inquired for dense subdivision growth. These areas once developed will provide pockets of dense development spotted in sewerage utility areas throughout the Maxwell CCN.



Maxwell SUD has adopted a fire flow policy to provide fire flow to those portions of the Maxwell SUD service area that fall within the current or future extraterritorial jurisdiction of the City of San Marcos, the City of Lockhart, the City of Kyle and the City of Martindale.

1.1.3 Current Population

Maxwell SUD current population is an estimated 7,203 based on current meter count (2,401) and assuming three people per meter.

2. EXISTING INFRASTRUCTURE

The existing water supply is provided from the Edwards Aquifer, which provides water from the west, and Hays/Caldwell Canyon Regional Water Authority Water Treatment Plant, which provides water from the southwest. The existing waterworks system is comprised of two (2) Edwards Aquifer water wells (700 gpm and 700 gpm capabilities), 31% of a 6.0 MGD CRWA Hays Caldwell Surface Water Treatment Plant, two (2) elevated storage tanks (150,000 gallons and 500,000 gallons), two (2) ground storage standpipe reservoirs (278,000 gallons and 310,000 gallons), and approximately 110 miles of distribution mains ranging in size from 1-inch to 16-inches in diameter within a 62.57 square mile CCN boundary.

2.1 Water Rights

The following table shows the existing water rights that Maxwell SUD currently holds at the date of this report.

Table 1. Existing Water Rights

Name	Existing Water Supply in Acre Feet	
	Ground	Surface
Ingram Edwards (Own)	278.527	-
GBRA	-	644
Cummings	-	188
Baugh	-	60
Foster	-	8
Hohn Edwards Lease	17.4	-
BK Edwards Lease	103.778	-
Total Supply:	399.705	900
	1299.705	



Based on the total water supply of 1,299.705 acre feet and assuming 3 connections per acre feet, Maxwell SUD can currently serve 3,899 connections. Once the system reaches 3,314 connections the 85% rule will trigger, and new water sources will need to be looked at and acquired. In 2022 Maxwell SUD executed a water supply contract with the Guadalupe Blanco River Authority for 1,500 acre-feet to be delivered in a few years. Maxwell SUD is will also sign a water supply contract with Canyon Regional Water Authority for an additional 3,000 acre-feet for water to be delivered in a few years.

The Edwards Aquifer Authority has been known to decrease the amount of water pumped from the aquifer as each calendar year progresses. Knowing this Maxwell SUD has planned for the well site Edwards wells to not be used throughout a calendar year but managed in a way to ensure water supply is available for use later in the calendar year. Another proposed project for water supply is to drill a Trinity Aquifer test well to see if this is a viable water source option of the well site property.

For a historical perspective the following table details the connections and total water used for each year.

Table 2. Historical Water Use

Year	Connections	Acre Feet Pumped	Connections Per Acre Feet
2009	1,689	354	4.77
2010	1,707	339	5.04
2011	1,725	400	4.31
2012	1,694	477	3.56
2013	1,691	350	4.83
2014	1,677	343	4.88
2015	1,682	366	4.60
2016	1,696	364	4.66
2017	1,762	488	3.61
2018	1,712	451	3.80
2019	1,769	469	3.77
2020	1,820	554	3.29
2021	2,106	648	3.25
2022	2,401	800	3.00
		Average:	4.10



If the connections per acre feet number remains above 3, the planning numbers assumed in this report at 3 connections per acre foot is an accurate number.

2.2 Water Production

The Texas Commission on Environmental Quality (TCEQ) sets forth rules and guidelines for minimum water system capacities for the public to have safe and adequate potable water available. For water systems serving more than 250 connections, the TCEQ requirements for water production states the system shall have two or more wells having a total capacity of 0.6 gpm per connection for groundwater sources. For surface water sources, a water shall system have a treatment capacity of 0.6 gpm per connection under normal rated design flow. Based on these guidelines, the production capacity and number of connections that each water source can serve per TCEQ requirements is summarized in Table 3 below.

Table 3 Current Production Facilities

Production Facility	Capacity (gpm)	Total Potential Customers
Well No. 2	700	1,162
Well No. 3	700	1,162
HCWTP (1,800 gpm x 31%)	558	926
Total	1,958	3,250

Based on the current connection of 2,401, Maxwell SUD is at 73% of Production Facility Capacity. Once the system reaches 85% of production facility capacity, Maxwell SUD is required to begin upgrading the pump capacity at any existing production facility or propose a new pumping station more than likely from a future water source delivery point.

Maxwell SUD currently owns 31% of the Hays Caldwell WTP which includes pumps, treatment capacity, raw water intake and the 1 million gallon clear well (ground storage tank). Currently the treatment plant can produce 6 million gallons a day or 4,167 gallon per minute but there are only two pumps currently transmitting water into the Maxwell SUD service area. Each pump is rated at 1,800 gpm but the TCEQ only accounts for firm pumpage amount which is the largest pump out of service. Based on this information we



can only use one 1,800 gpm pump as a production facility and Maxwell’s portion is only 31% of the firm capacity or 558 gpm.

2.3 Water Storage

The TCEQ’s requirement for total storage for public water systems with 250 or more connections is to have a total storage capacity of 200 gallons per connection with 100 gallons of elevated storage capacity and 100 gallons of ground storage capacity. But if the water system provides 200 gallons per connections of elevated storage, which Maxwell SUD does, the TCEQ allows the booster pump capacity to reduce the 2 gpm per connection to 0.6 gpm per connection. The water storage capacity and number of connections that each water tank can serve per TCEQ requirements is summarized in Table 4 and 5 below.

Table 4 Ground Storage Capacity

Water Storage Facility	Capacity (gallons)	Total Potential Customers
FM 1984 Standpipe (GS)	231,400	2,314
Fentress Standpipe (GS)	310,000	3,100
HCWTP 1.0 MG Clear Well (31%)	310,000	3,100
Total	851,400	8,514

Based on the current connection of 2,401, Maxwell SUD is at 28% of Ground Storage Capacity. Once the system reaches 85% of ground storage capacity, Maxwell SUD is required to begin upgrading the ground storage capacity at any or new ground storage facilities.

Table 5 Elevated Storage Capacity

Water Storage Facility	Capacity (gallons)	Total Potential Customers
FM 1966 Elevated Tank	150,000	750
Bill Vaughn Elevated Tank	500,000	2,500
Total	650,000	3,250



Based on the current connection of 2,401, Maxwell SUD is at 74% of Elevated Storage Capacity. Once the system reaches 85% of elevated storage capacity, Maxwell SUD is required to begin upgrading the elevated storage capacity at any or new elevated storage facilities.

The water system does not provide fire flow but, per past Board policy, if a development lies within the ETJ of a municipality then the water system will design and construct new facilities in these areas to handle fire flow. Typically, the fire marshal requires a fire flow of approximately 1,000 gpm for a 2-hour duration, which results in 120,000 gallons for fire storage. This will most likely be provided in the elevated storage in addition to the capacity required by the TCEQ.

2.4 Booster Pumps

TCEQ requirements state a water system must have two or more pumps with the capacity of 2 gpm per connection or that have a total capacity of at least 1,000 gpm and the ability to meet peak hourly demands with the largest pump out of service, whichever is less. For systems that provide an elevated storage capacity of 200 gallons per connection, two service pumps with a minimum combined capacity of 0.6 gpm per connection is required. As in the case with Maxwell SUD, if only wells and elevated storage are available, service pumps are not required.

As Maxwell SUD is currently configured, there are neither booster stations nor pumps within the water system. The only pumps are located at the Hays Caldwell Water Treatment Plant and the Edwards well field, both considered water production facilities. As future water supply delivery points are developed within the Maxwell CNN area the addition of high service pumps will be added as needed in the future.

2.5 Water Distribution

The TCEQ's water distribution requirement states that the water system must maintain at least 35 psi throughout the water distribution system at a demand of 1.5 gpm per connection. The hydraulic model of the water system does not indicate any low pressure within the distribution system when analyzed at a historical peak demand.



The upgrades proposed in the future will be dictated by growth areas in the event the existing mains cannot provide the necessary flow to a new subdivision or development.

3. PROJECTED GROWTH AND LAND USE

Currently it is projected that most of the growth will occur due to development in the form of residential subdivisions. The growth within the next ten years is expected in areas currently with either a formal service inquiry or an informal information request where land has been purchased by a potential developer.

3.1 Projected Growth

The latest State Region “L” Water Plan shows growth and water use as shown on the following Table 6.

Table 6 Region “L” Population Growth and Water Demand

Population								
County\Year			2020	2030	2040	2050	2060	2070
Caldwell			4,211	5,156	6,086	7,008	7,939	8,846
Hays			1,185	1,291	1,419	1,580	1,761	1,968
Total:			5,396	6,447	7,505	8,588	9,700	10,814
Connections:			1,799	2,149	2,502	2,863	3,233	3,605
Growth Rate:				1.95%	1.64%	1.44%	1.29%	1.15%
Water Demand in acre feet								
County\Year			2020	2030	2040	2050	2060	2070
Caldwell			428	503	579	659	745	829
Hays			120	126	135	149	165	184
Total:			548	629	714	808	910	1,013
AF per connection:			0.30	0.29	0.29	0.28	0.28	0.28

Table 7 offers a more realistic growth rates as used in the 2022 Impact Fee report.



Table 7 Maxwell SUD Impact Fee Growth Rates

Growth Rate		Conn			Pop
1.50%	2010	1707			5,121
	2011	1725			5,175
	2012	1694			5,082
	2013	1691			5,073
	2014	1677			5,031
	2015	1682			5,046
	2016	1696			5,088
	2017	1762			5,286
	2018	1712			5,136
	2019	1769			5,307
	2020	1820			5,460
	2021	2106			6,318
14.00%	2022	2401			7,203
	2023	2737			8,211
	2024	3120			9,360
	2025	3557			10,671
	2026	4055			12,165
	2027	4623			13,868
	2028	5270			15,809
9.00%	2029	5744			17,232
	2030	6261			18,783
	2031	6825			20,474
	2032	7439			22,316

As time passes there are several factors that can cause a change in the growth projections. Any significant growth will most likely occur due to a large development which will have to provide the necessary infrastructure improvements. The potential for Developer's to form Municipal Utility Districts is now more frequent per recent water service requests and will create sparse but dense developments throughout the Maxwell CCN area.



Therefore, frequent periodic review of meter growth and the impact on the system is highly recommended.

3.2 Projected Land Use

We assume that the major roadways located throughout the water system will front mainly commercial type properties and the large acreage tracts located within the CCN will be most likely will end up large lot to dense residential single-family developments. There will be small pockets of light industrial located around the train tracks in the southwest portion of the system. We also anticipate the remaining farmland to eventually convert to residential developments as older families convert from a rural area to a more municipal denser development.

4. CAPITAL IMPROVEMENTS

Since Maxwell SUD has several inquiries with dense development the closest asset to start being limited, by increasing towards the TCEQ 85% Rule, is the amount of raw/treated water currently in water system inventory. The Board has signed a contract with GBRA for 1,500 acre-feet of water supply to be delivered by 2025. Also, Maxwell is participating in the CRWA Wells Ranch III project in the amount of 3,000 acre-feet of new water supply to be delivered in. The remaining capital improvements are known water system needs based on historical knowledge, growth and future growth rates. The capital projects are listed on Table 8 and discussed more in depth here. Please note that most distribution main upgrades are development driven since we do not know where, when and number of connections of future development. Thus, water main upgrades maybe added in the future if the pipe upgrade does not only serve the proposed development but improves the water system as a whole. The following projects described are the proposed projects determined to be necessary during the next 10-year period as analyzed in the Impact Fee Report. Note Table 8 is taken directly from the 2022 Impact Fee Report Table 2.

4.1 Water Pipeline Improvements

Taking know potential subdivision's locations and applying the growth rates developed for the impact Fee report the water model helped determine water mains of insufficient capacity to handle the future growth. The nine water main projects shown on Table 8 will help keep the water system velocities to remain below 6 feet per second during a peak hour type demand.



Budgeted Amount: \$12,953,520

4.2 Yarrington Road Elevated Tank Site, Booster Station

This project will construct approximately a 250,000-gallon ground storage tank, three 500 gpm can pump station with one blank, yard piping, chlorine building with two feeds, additional gravel driveway and some site grading. We plan to have a gate valve and pipe connecting the regular pressure side of the system to this higher-pressure side of the system so that in the event of electrical loss at the booster station this gate valve can be opened so that the new high-pressure area will have water versus no water during a crisis event.

Budgeted Amount: \$1,890,000

4.3 Harris Hill 750,000 Gallon Elevated Tank

Due to growth of the Highway 21 and west area, this tank will be required in the future to maintain continuous pressure to the extreme west side of the system. We budgeted for a composite elevated tank which gives the best cost basis ratio for re-coating in over a 30 to 40 year life. The new tank is proposed to be 50' higher in elevation than the current Yarrington Road Elevated Tank to allow the higher elevation along Harris Hill Road to be better served with a higher-pressure pane. This size elevated tank will serve 7,500 additional connections in the future.

Budgeted Amount: \$4,725,000

4.4 FM 1966 West 750,000 Gallon Elevated Tank

Due to growth of the FM 1966 area and east, this tank will be required in the future to maintain continuous pressure to the east side of the system. Note this tank can be moved further east to better serve the entire water system. As growth develops the location can be modified to the SH 142 hill area to better serve the east portion of the system as well as the west. This tank will be at the same hydraulic grade line of 787' msl as the exiting Maxwell current tanks. We budgeted for a composite elevated tank which gives the best cost basis ratio for re-coating in over a 30-to-40-year life. This size elevated tank will serve 7,500 additional connections in the future.

Budgeted Amount: \$4,725,000

4.5 SH 142 East, Booster Station

This project will construct a total storage of 750,000 gallons of ground storage in one or multiple tanks, four 500 gpm can pump station with one blank, yard piping, chlorine building with two feeds, additional gravel driveway and some site grading. This site is



projected to be the delivery point from the GBRA 1,500 acre-feet water source. The storage amount is slightly larger than required by the TCEQ but will offer better future operations to allow an average daily flow from GBRA while the ground storage tank(s) will buffer the peak flow daily demand normally exhibited by water systems.

Budgeted Amount: \$4,185,000

4.6 Maxwell Office Tract, Booster Station

This project will construct a total storage of 500,000 gallons of ground storage in one or multiple tanks, four 500 gpm can pump station with one blank, yard piping, chlorine building with two feeds, additional gravel driveway and some site grading. This site is projected to be the delivery point from the CRWA 3,000 acre-feet water source. The storage amount is slightly larger than required by the TCEQ but will offer better future operations to allow an average daily flow from CRWA while the ground storage tank(s) will buffer the peak flow daily demand normally exhibited by water systems.

Budgeted Amount: \$3,105,000

4.7 Edwards Well Site New Trinity Well, Test Well

Although this project is not a part of the 10-year Impact Fee report we added this project here in the capital improvement projects due the importance of securing additional water supply. The need for this project is critical but due to other water supply projects being constructed first this project falls out the next 10-year window. Also, the unknown quantity of water that can be secured served to push this project out of the Impact Fee Report window. Maxwell SUD has enough room at the current Edwards Well Site to house one or two new trinity aquifer wells and, if necessary, a future elevated tank. This project would entail drilling a test well that would be described as a smaller type well in order to verify potential well capacity from the trinity aquifer at the existing well site. Once the capacity is determined than the Board may or may not elect to drill the final larger well.

Budgeted Amount: \$350,000



Table 8
(Taken from Table 2 of the Impact Fee Report)
Future Projects Anticipated Construction Cost
MAXWELL SPECIAL UTILITY DISTRICT
YEAR 2070 CAPITAL IMPROVEMENTS PLAN

24-Aug-22

Projects to be completed between Year 2022 through Year 2032:

Construction Years	Project Name	Description	Length (ft)	Diameter (in)	Cost
2028	Well Site Transmission	Well Site to IH 35	5,200	16	\$998,400
2028	Well Site Transmission	Blanco River Bore	500	16	\$144,000
2023-2024	Maxwell Main Spine	FM 1966 ET to 12" on SH 142	15,800	16	\$3,033,600
2023-2024	SH 142 Extension	Jolly Road to East SH 142	11,500	16	\$2,208,000
2023	Maxwell Bottle Neck	Repalce 6" segment on SH 142	450	12	\$64,800
2024	Sunset/Hymeadow Line	Connect the 2 Subdivisions	850	12	\$122,400
2027	ARWA Delivery Line	Connect Delivery Point to GST	3,000	16	\$576,000
2026	Tower Road	Connect SH 142 Main to East	2,650	16	\$508,800
2026	Black Ankle Road	Move water to East	10,100	16	\$1,939,200
			Pipe Sub-total:		\$9,595,200
<u>Pump:</u>					
See Booster Stations Below for specific pump locations					
				Pump Sub-total:	\$0
<u>Storage:</u>					
2023-2024	Harris Hill ET	750,000 Gallon Elevated Tank			\$3,500,000
2025-2026	FM 1966 West ET	750,000 Gallon Elevated Tank			\$3,500,000
				Storage Sub-total:	\$7,000,000
2026-2027	<u>Maxwell Booster Station</u>				
	Ground Storage Tank	500,000 Gallon Ground StorageTank			\$1,600,000
	Pump Capacity	2,000 gpm			\$400,000
	Electrical, Building, SCADA				\$300,000
				Maxwell BS Sub-total:	\$2,300,000
2023-2024	<u>SH 142 East Booster Station</u>				
	Ground Storage Tank	750,000 Gallon Ground StorageTank			\$2,400,000
	Pump Capacity	2,000 gpm			\$400,000
	Electrical, Building, SCADA				\$300,000
				SH 142 BS Sub-total:	\$3,100,000
2023-2024	<u>Yarrington ET Booster Station</u>				
	Ground Storage Tank	250,000 Gallon Ground StorageTank			\$800,000
	Pump Capacity	2,000 gpm			\$300,000
	Electrical, Building, SCADA				\$300,000
				SH 142 BS Sub-total:	\$1,400,000
				Contingency (15%):	\$3,509,280
				Professional Fees (20%):	\$4,679,040
				Year 2022-2032 Total:	\$31,583,520